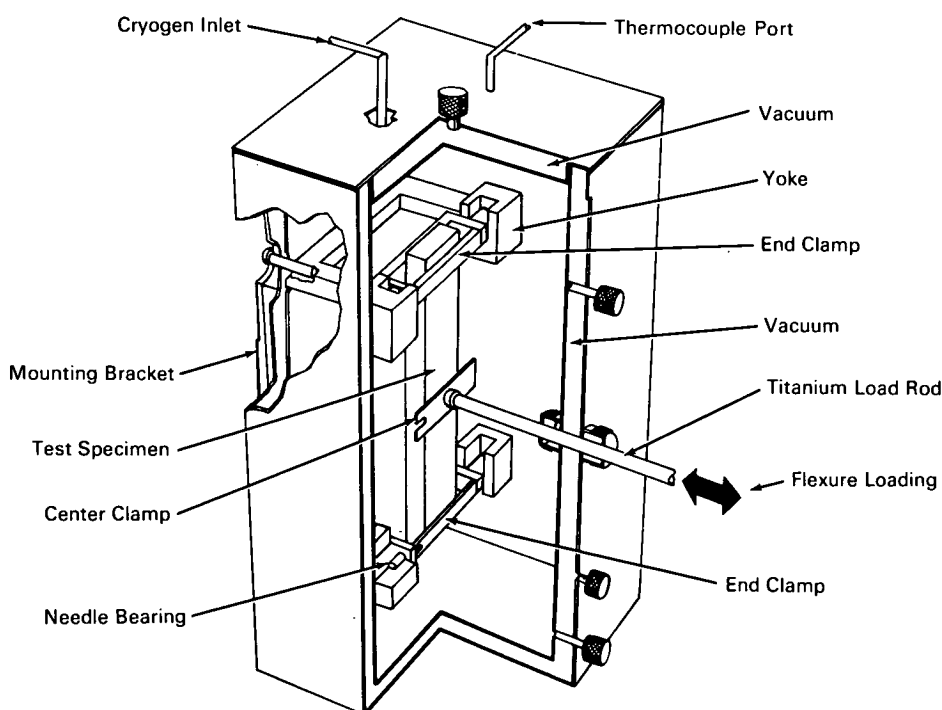


NASA TECH BRIEF



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Apparatus Permits Flexure Testing of Specimens at Cryogenic Temperatures



The problem: To provide a means for flexure fatigue testing of honeycomb composite sandwich structures at cryogenic temperatures.

The solution: A cryostat with an arrangement for supporting a test specimen during application of flexure loads.

How it's done: The flexure fatigue cryostat consists of a vertically mounted top-loading, vacuum-jacketed cryogen container enclosing two pairs of yokes which support two axially rotating end clamps in needle bearings. The yoke slots are machined deeply enough to permit the needle bearings to move vertically in

order to compensate for any variation of chord length during dynamic flexure. The center clamp is used to secure a titanium load rod to the specimen.

The end clamps and the center clamp are attached to the flexure specimen, and the assembly is properly positioned in the cryostat. One end of the load rod is inserted through a sealed bearing in the cryostat and fastened to the center clamp. The other end of the load rod is attached to a horizontal-loading flexure fatigue machine. The specimen deflection is sensed by means of a differential transformer mounted on the head of the fatigue-machine load actuator, and the static and dynamic loads are sensed through a load cell. Both

(continued overleaf)

deflection and loads can be permanently recorded by conventional means.

Notes:

1. With suitable modification of the support arrangement, this apparatus can be used for flexure fatigue testing of any solid material at cryogenic temperatures.
2. Inquiries concerning this invention may be directed to:

Technology Utilization Officer
Marshall Space Flight Center
Huntsville, Alabama, 35812
Reference: B65-10129

Patent status: NASA encourages the immediate commercial use of this invention. Inquiries about obtaining rights for its commercial use may be made to NASA, Code AGP, Washington, D.C., 20546.

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